



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,278	03/01/2005	Christian Block	14219-079US1 P2002,0828 U	6665
26161	7590	04/17/2009		
FISH & RICHARDSON PC				
P.O. BOX 1022				
MINNEAPOLIS, MN 55440-1022				
EXAMINER				
BAUER, SCOTT ALLEN				
ART UNIT		PAPER NUMBER		
2836				
NOTIFICATION DATE		DELIVERY MODE		
04/17/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

# Office Action Summary

**Application No.**

10/526,278

**Applicant(s)**

BLOCK ET AL.

**Examiner**

SCOTT BAUER

**Art Unit**

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 February 2009.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 22-44 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 22-44 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 01 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-85/86)  
Paper No(s)/Mail Date 01/26/09 & 02/11/09  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 22-24, 26-29, 31 & 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yrjölä et al. (US 5,521,561) in view of Larson. (US 6,822,295).

With regard to claim 22, Yrjölä, in Figure 2, discloses circuitry for use in a mobile telephone (column 1 lines 13-21) comprising: a terminal (A) for use with a high-frequency signal; at least two signal lines (R & T); a switching unit (K) for connecting the terminal to a signal line.

Yrjölä does not teach a primary protection device for protecting against electrostatic discharges, the primary protection device being between the terminal and the switching unit, the primary protection device comprising a first element that diverts all voltages having a pulse height greater than a 200 V switching voltage to a reference potential.

Larson, in figure 1, and column 2 lines 6-19, teaches a device for receiving an RF signal from a terminal (112) wherein the device is prone to damage caused by surge voltages. The device is designed for use with RF signals in the microwave range from 900 MHz – 5.8 GHz (column 1 lines 36-45), which is the frequency band in which TDMA mobile phones operate. The device comprises a primary protection device (103, 104 & 106) being between a terminal (112) and a protected receiving device (111), the primary protection device comprising a first element (103, 104 & 106) that diverts all voltages having a pulse height greater than a 200 V switching voltage to a reference potential (column 6 lines 60-63).

Larson teaches that when the voltage at the terminal rises above 8 volts, which is the reverse breakdown voltage (6.5 V) of the zener diode (106) plus a forward biasing voltage of the PiN diode (101), the circuit will divert the voltage to ground.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yrjölä with Larson, by providing the circuit protection of Larson into the device of Yrjölä for the purpose of protecting the RF equipment of Yrjölä without degrading the signal quality.

With regard to claims 23 & 24, Yrjölä in view of Larson teaches the circuitry of claim 22.

Yrjölä in view of Larson further teaches that the first element has an insertion attenuation that is less than 0.3 dB (column 6 lines 3-11), and that the first element has a capacitance that is less than 1 pF (column 8 lines 1-7).

With regard to Claim 26, Yrjölä in view of Larson discloses the circuitry of Claim 22. Larson further discloses that the primary protection device comprises a circuit path (from 107 to 108) that connects the terminal and the switching unit; and wherein the first element (103, 104 & 106) connects the circuit path to the reference potential.

With regard to Claim 27, Yrjölä in view of Larson discloses the circuitry of Claim 22. Larson, in Fig. 2 further discloses a second element (101 & 102) that is in parallel with the first element, the second element for limiting a current load of the first element (column 3 lines 51-60).

With regard to Claim 28, Yrjölä in view of Larson discloses the circuitry of Claim 27. Larson further discloses a capacitor (105) on a circuit path between the first element (103, 104) and the second element (101, 102).

With regard to Claims 29 & 31, Yrjölä in view of Larson discloses the circuitry of claim 27. Siemens further discloses that the second element comprises is a discharger (101 & 102 discharges the current to ground) having a capacitance of less than 1 pF (column 6 lines 2-13).

With regard to claim 41, Yrjölä in view of Larson teaches the circuitry of claim 22.

Yrjölä further teaches an arrangement for separating transmission and reception wherein a gallium arsenide switch is used to connect a transmitter and a receiver to a single antenna.

With regard to claims 42 & 43, Yrjölä in view of Larson discloses the circuitry of claim 22, comprising an antenna and wherein the signal lines comprise transmitting and receive paths.

Yrjölä et al, in figure 10, teaches an antenna connected to a separate transmitter and receiver through a switch wherein the circuit is part of a mobile phone (column 1 lines 1-12).

2. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable Yrjölä in view of Larson as applied to claim 22 above, and further in view of Mizutani (US 6,525,346)

With regard to Claim 25, Yrjölä in view of Larson teaches the circuitry of claim 22. Larson further discloses that the first element comprises a double PiN diode ((103 & 104).

Yrjölä in view of Larson does not teach the first element comprises a gallium arsenide double diode.

Mizutani, in Figure 14, teaches that a PiN diode can be constructed from GaAs (column 8, lines 45-57).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yrjölä in view of Larson with Mizutani,

by constructing the double diodes taught by Larson with gallium arsenide, for the purpose of providing greater protection to the switching unit by increasing the switching speed of the protection circuit.

3. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yrjölä in view of Larson and further in view of Koss (US 5,122,921).

With regard to claim 32, Yrjölä in view of Larson discloses the device of claim 27.

Yrjölä in view of Larson does not teach that the second element comprises an inductive element having an inductance that is greater than 18 nH (column 4 lines 45-49).

Koss an arrangement similar to the protection of Larson wherein there is a capacitor and a first and a second element to protect a device. Koss teaches that a second element comprises an inductive element having an inductance that is greater than 18 nH (column 4 lines 45-49).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yrjölä in view of Larson with Koss, by incorporating the second element of Koss into the device Yrjölä in view of Larson, for the purpose of shunting transients that are too fast to trigger the protection device of Yrjölä in view of Larson (Koss column 5 line 64-column 6 line 14).

4. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yrjölä in view of Larson as applied to claim 22 above, and further in view of Shrier (US 4,977,357).

With regard to Claim 30, Yrjölä in view of Larson teaches the circuitry of claim 22. Yrjölä in view of Larson does not teach that the second element comprises a polymer suppressor.

Shrier, teaches a protection element comprising a polymer suppressor.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yrjölä in view of Larson with Shrier, by incorporating the device of Shrier into the device of Yrjölä in view of Larson, for the purpose of providing a protection device that can respond to repetitive electrical transients with nanosecond rise times and have low electrical capacitance (column 1 lines 12-18).

5. Claims 33, 35 & 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yrjölä in view of Larson as applied to claim 22 above, and further in view of Kurchuk et al. (US 6272327).

With regard to Claim 33, Yrjölä in view of Larson teaches the circuitry of claim 22.

Yrjölä in view of Larson does not teach that circuit paths that provide control signals to the switching unit, each of the circuit paths comprising a secondary protection device against electrostatic discharges.

Kurchuk et al., in Figure 2, teaches a high power wireless telephone with over-voltage protection, comprising circuit paths (36 & 38) that provide control signals to the switching unit (24), each of the circuit paths comprising a secondary protection device (44 & 46) against electrostatic discharges (column 3 lines 66 & 67 & column 4 lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yrjölä in view of Larson with Kurchuk et al., by Replacing the diplexer (3) taught by Yrjölä in view of Larson, with the switching unit taught by Kurchuk, for the purpose of providing a mobile phone with a switching unit that prevents receiver overloading without degrading the receiver sensitivity (Kurchuk et al. Column 2 lines 31-35).

With regard to Claim 35, Yrjölä in view of Larson and Kurchuk discloses the circuitry of Claim 22. Kurchuk further discloses that the switching units comprises field effect transistors (Q1 & Q2), a contact break distance of each of the field effect transistors connecting the terminal (30) to the signal line (32 & 34), and wherein the circuitry further comprises: circuit paths that connect to gates of the field effect transistors, the circuit paths (40 & 42) for providing control signals to the gates, each of the circuit paths comprising a secondary protection device (44 & 46) for protecting against electrostatic discharges.

With regard to Claim 34, Yrjölä in view of Larson and Kurchuk discloses the circuitry of Claim 35. Kurchuk further discloses that at least one secondary protection device (44) is connected to the reference potential.

6. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yrjölä in view of Larson as applied to claim 22 above, and further in view of Toshiba (JP 02000134945).

With regard to Claim 34, Yrjölä in view of Larson teaches the circuitry of claim 22.

Yrjölä in view of Larson does not teach that the circuitry further comprises a circuit path for supplying for an operating voltage to the switching unit, the circuit path comprising a secondary protection device for protecting against electrostatic discharges.

Toshiba, in Figure 1, teaches a surge protection circuit for a switching unit (4) the circuit path supplies an operating voltage to the switching unit and the path comprises a protection device (6) for protecting against electrostatic discharges.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yrjölä in view of Larson with Toshiba, by protecting power terminal of the switching network taught by Yrjölä in view of Larson, with the protection device taught by Toshiba for the purpose of bypassing surge currents and voltages in the event of a line fault.

7. Claims 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yrjölä in view of Larson and Kurchuk as applied to claim 33 above, and further in view of Ikeda et al. (US 5276422).

With regard to Claims 36-38, Yrjölä in view of Larson and Kurchuk teaches the circuitry of claim 36 and further teaches that the voltage limiting element comprises a zener diode (106) having a switching voltage that is less than 100 V as explained above.

Yrjölä in view of Larson and Kurchuk et al. does not teach that the voltage limiting element comprises a varistor.

Ikeda teaches a device to protect a load. The device contains an element (14) that absorbs surge voltages. Ikeda further teaches that the element (14) can be a CR filter, a varistor or a zener diode (column 3 lines 66-68 & column 4 lines 1-6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yrjölä in view of Larson and Kurchuk with Ikeda, by using the varistor of Ikeda as the zener diode taught by Larson, for the purpose of providing a voltage limiting element with a fast reaction time that increases the switching speed of the switching unit.

8. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yrjölä in view of Larson as applied to claim 22 above, and further in view of Trikha et al. (US 6,072,993)

With regard to Claim 40, Yrjölä in view of Larson discloses the circuitry of claim 22.

Yrjölä in view of Larson does not teach that the switching unit comprises PIN diodes.

Trikha, in Figure 3A, teaches a diplexer for a cellular phone wherein the switching element comprises pin diodes (116', 118', 120', & 122').

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yrjölä in view of Larson with Trikha, by replacing the switching unit taught by Yrjölä in view of Larson with the diplexer taught by Trikha, for the purpose of using the device in high frequency applications.

9. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yrjölä in view of Larson and further in view of Landy (2002/0080537).

With regard to claim 44, Yrjölä in view of Larson teaches the circuitry of claim 22.

Yrjölä in view of Larson does not teach that the switching unit and the primary protection device are integrated into a multi-layer ceramic substrate.

Landy, in Figure 1, teaches an ESD protected RX/TX switch circuit wherein the switch and the ESD protection are implemented as an RF integrated circuit which would necessarily comprise a multi-layer ceramic substrate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yrjölä in view of Larson with Landy, by

incorporating a primary protection device and switch into one single unit on a multi-layer ceramic substrate, for the purpose of making the circuit more easy to mass produce thus decreasing the cost of the device.

### ***Response to Arguments***

10. Applicant's arguments with respect to claims 22-44 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's previous arguments to the combination of Yrjölä with Kosuga were addressed in the new rejection as both Yrjölä and Larson teach that their devices are operated in the microwave range. Further, Larson clearly states that voltages over 8 volts are shunted to ground and thus explicitly teaches that all voltages over 200 volts are diverted to a reference potential.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT BAUER whose telephone number is (571)272-5986. The examiner can normally be reached on M-F 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on 571-272-1867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SAB  
03 APR 09

/Robert DeBeradinis/

Primary Examiner, Art Unit 2836